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Application No.: 10/064,503  
Docket No.: 9170-US-PA

third adsorbing layer comprising an adsorbent capable of selectively adsorbing CO<sub>2</sub> and the method further comprising using the third adsorbing layer to adsorb and remove CO<sub>2</sub> from the air passing the first adsorbing layer.

### **REMARKS**

#### **Present Status of the Application**

The Office Action mailed on January 15, 2004 rejected all presently pending claims 1, 4, 6 and 8-11 under 35 U.S.C. 102(e) as being anticipated by Ojo et al. (US 6,409,800). In response thereto, Applicants have added new claims 12-18. Reconsideration of claims 1, 4, 6 and 8-11 and consideration of new claims 12-18 are respectfully requested.

#### **Interview Summary**

The undersigned would like to thank Examiner Frank Lawrence for granting a telephonic interview on April 13, 2004, during which the 35 USC102(e) rejection based on the reference Ojo (US 6,409,800) was discussed. More particularly, the undersigned and the Examiner discussed about the cation-exchange of Ojo being conducted between a composite of sodium X/sodium A zeolite with either calcium hydroxide or magnesium hydroxide to obtain a composite that contains a sodium calcium X with a sodium calcium A zeolite or a sodium magnesium X with a sodium magnesium A zeolite. Therefore, the adsorbents of Ojo are different from ours, which are magnesium calcium X zeolites or magnesium calcium A zeolites

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as claimed in claims 4 and 6, respectively. Therefore, regardless of what the exchange ratio is in Ojo, the metal complexes are fundamentally different from those in the prior art. The Examiner acknowledged our argument. The Examiner, however, argued that Ojo teaches in claim 12 that the exchangeable cations of Ojo's zeolite A or X comprises calcium, magnesium, strontium, ..., or mixtures thereof. Therefore, it would possible for Ojo to have a Na-Mg-Ca zeolite. He recommended amending our claim language to reflect the aforementioned arguments.

The undersigned and the Examiner further discussed the magnesium-exchange ratio in which the total cations of the X or A zeolite is higher than 5% in the instant case, whereas Ojo teaches in claim 12 that "wherein about 50 to about 100% of the exchangeable cations of said zeolite A and about 50 to about 100% of the exchangeable cations of said zeolite X comprises calcium, magnesium, .....or mixtures thereof". Although, there is an overlapping in the range, our experimental results indicate that there is a significant increase in the amount adsorbed between 5 to 50% as illustrated in Figure 4 and 5 for the X and A zeolite, respectively, which suggests the claimed range achieves unexpected results relative to the prior art. The Examiner's attention was respectfully directed to the MPEP (Chapter 2144.05), which states that "applicants can rebut a prima facie case of obviousness based on over overlapping ranges by showing the criticality of the claimed range." The Examiner agreed to our argument; however, he still recommended amending our range to read from 5% to less than 50%. He further commented that such an amendment would seem to render the instant case not to read on the Ojo prior art.

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### **Notes for New Claims 12-18**

The newly added independent claims 12, 13 and 16 are similar to the original independent claims 1, 4 and 9, respectively, wherein the X zeolite in claims 12, 13 and 16 is further restricted to *contain merely a trace of A zeolite as an impurity*. This restriction is not a new matter because an X zeolite is used alone in Experiments 1 and 2 (paragraphs [0046]-[0049]) disclosed in the specification and *a trace of A zeolite is inherently formed as an impurity during the synthesis process of an X zeolite*.

In addition, new independent claim 14 is similar to the original independent claim 6, but the second adsorbent comprising an A zeolite in claim 14 is further restricted to *not to contain an X zeolite*. This restriction is not a new matter either since *an A zeolite is used alone without an X zeolite* in Experiment 3, which is described in paragraphs [0050]-[0051] of the specification.

### **Discussion of Rejections of Claims 1, 4, 6 and 8-11**

Claims 1, 4, 6 and 8-11 were rejected under 35 U.S.C. 102(e) as being anticipated by Ojo et al. Applicants' arguments are provided as follows.

Please refer to independent claims 1, 4, 6 and 9, the second adsorbent in claim 1, 4, 6 or 9 comprises an X zeolite or an A zeolite.

Ojo et al. fail to teach or suggest to use an X zeolite or an A zeolite as an adsorbent. As stated in page 2 of the Office Action, the second layer of Ojo et al. comprises *a composition of A*

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*and X zeolites, but not an X or A zeolite.* Ojo et al. even teaches away to use an X or A zeolite alone, as described in col. 1, line 67-col. 2, line 7:

*"For example, type A zeolites, such as cation-exchanged zeolite A and particularly calcium zeolite A, selectively remove some hydrocarbons from air, but they do not preferentially adsorb nitrogen oxides, while, on the other hand, divalent cation-exchanged type X zeolites, such as calcium X zeolite, readily adsorb nitrogen oxides from air, but do not remove all hydrocarbons from air"*

For at least the reasons mentioned above, Applicants respectfully submit that independent claims 1, 4, 6 and 9 patently define over the prior art.

For at least the same reasons mentioned above, Applicants respectfully submit that claims 8 and 10-11 dependent from claims 1 and 9, respectively, also patently define over the prior art.

#### **Discussion of New Claims 12-18**

As mentioned above, new independent claims 12, 13 and 16 are different from old independent claims 1, 4 and 9 in that the X zeolite is further restricted to *contain merely a trace of A zeolite as an impurity.*

Ojo et al. fail to teach or suggest the above feature, because the A zeolite is *an important component, rather than an impurity*, in the composite zeolite adsorbent of Ojo et al. and has an amount of at least 5wt% in the composite zeolite adsorbent, as described in claim 1. As one skilled in the art knows, *the amount of A zeolite as an impurity in an X zeolite is always less*

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*than 5wt%*. Therefore, the scope of the second adsorbent in new independent claim 12, 13 or 16 does not overlap with that of the composite zeolite adsorbent in Ojo et al.

Moreover, Ojo et al. even teaches away to use an X zeolite alone (including a trace of A zeolite as an impurity in the X zeolite, of course), as mentioned above.

For at least the reasons mentioned above, Applicants respectfully submit that new independent claims 12, 13 and 16 patently define over the prior art.

For at least the same reasons mentioned above, Applicants respectfully submit that claims 15 and 17-18 dependent from claims 12 and 16, respectively, also patently define over the prior art.

Similarly, new independent claim 14 is different from old independent claim 6 in that *the second adsorbent does not contain an X zeolite*. Ojo et al. fail to teach or suggest this feature because the composite zeolite adsorbent of Ojo et al. *must comprise an X zeolite as a necessary component*, as described in claim 1. Moreover, Ojo et al. even teaches away to use an A zeolite alone, as mentioned above.

For at least the reasons mentioned above, Applicants respectfully submit that new independent claim 14 patently defines over the prior art.

### **CONCLUSION**

For at least the forgoing reasons, it is believed that pending claims 1, 4, 6 and 8-11 and new claims 12-18 are in proper condition for allowance. If the Examiner believes that a

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telephone conference would expedite the examination of the above-identified patent application,  
the Examiner is invited to call the undersigned.

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